Lehr– und Didaktiksysteme
LD Didactic GmbH
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01/08-CS

Operating instructions 471 821

He-Ne laser head, 5 mW (471 821)

1 Beam exit opening
2 Aperture for blocking the laser beam
3 Connection lead with high voltage plug
4 Warning and information signs
5 Earth connection

Safety notes

The He-Ne laser emits visible radiation at a wavelength of 632.8 nm with a max. emission power of 5 mV and therefore it conforms to the rules for class 3B in EN 60825-1 “Safety of laser products”. The accessible laser radiation is dangerous for the eyes and in particular cases also for the skin.

Warning

Caution – If equipment other than that described here is used for operation or calibration or if different processes are carried out, this could lead to dangerous exposure to radiation.

Protection measures and behaviour rules

- Only allow the He-Ne laser to be operated by authorised and trained people.
- Anybody involved with or observing the experiment is to be instructed about the hazards from laser radiation and the necessary protection measures.
- Do not look directly into the laser beam, not even when its diameter has been widened e.g. by means of inserted lenses.
- Carry out experiments with the lowest power of radiation required.
- Avoid unintended reflections (e.g. from tools, watches, jewellery).
- Restrict the laser area to the necessary size by means of screens.
- Rooms, where experiments using laser light are carried out are to be labelled with warning signs.
- The path of the beam is to be adjusted in such a way that it is not at eye height, neither for standing nor for sitting people.
- Any optical equipment located in the optical path is to be fixed in such a way that any unintended change in its position is not possible.
- The optical effects to be investigated are always to be observed on a projection or transparent screen where diffuse reflection or scattering reduces the strength of the radiation to a value which is safe for the observing eye. Even with optimum diffuse reflection, where there are no directional parts of the beam, the following limiting values apply:
  - the minimum distance between the diffuse reflector and the cornea must be 13 cm,
  - the maximum observation time is 10 s.
- With many diffusers, directional parts of the beam are to be expected. For this reason the observation distance should be chosen to be much greater and/or the observation time much shorter. For the observation of the images or figures created by diffuse, scattered or diffracted laser light in an experiment, the dazzling limit must never be exceeded.
- Radiation above the maximum permissible exposure (MPE) also from reflected or scattered laser radiation is to be prevented. If this is not possible with lasers of class 3B, appropriate eye protection (e.g. adjustment goggles for He-Ne laser (471 828)), protective clothing or gloves are to be worn. In doubt, the laser safety officer is to be involved.
- When not in use, the laser equipment is to be protected against unauthorised use by removing the key from the key switch in the power supply.

- In Germany the accident prevention rules according to BGV B2 “Laser radiation” and if applicable any directives from the culture minister apply, in other countries the regulations applicable there have to be observed.

The light-proof housing reliably prevents the emission of uncontrolled radiation. The laser beam exit is found at the end of the cylinder which is marked with the sign “Beam exit”. In addition an aperture is provided there which can be used for blocking the beam.

For safe operation, the power supply for the He-Ne laser 5mW (471 825) is required. In order to prevent starting up by unauthorised persons, the power supply for the He-Ne laser 5mW (471 825) is equipped with a key switch.

The safe operation of the He-Ne laser is guaranteed for the intended use. However, safety is not warranted if the He-Ne laser is operated inappropriately or treated without due care. If it must be assumed that safe operation is no longer possible, the He-Ne laser must be switched off without delay (e.g. when there is obvious damage).

- Before starting up, the housing is to be inspected for damage. In the case of functional faults or visible damage the He-Ne laser is to be switched off and secured against unintended operation.
- On account of the operating and starting voltages, which may reach a level dangerous to life, the housing must not be opened under any circumstances.

Warning and information signs

1 Description

The He-Ne laser head 5 mW provides a narrow, nearly parallel beam of monochromatic, coherent and linearly polarised light. It is an ideal laser light source for all experimental setups where higher power is desired (e.g. laser Doppler anemometry). On account of the linear polarisation, this laser is also suitable for experiments on the rotation of the polarisation plane and light modulation (e.g. saccharimetry, Faraday effect, Kerr effect and Pockels effect).

2 Scope of delivery

1 He-Ne laser head with permanently attached connection lead with HV plug.

In addition the following is required:

1 Power supply for He-Ne laser 5 mW (471 825)

In addition the following is recommended:

1 Laser support (470 010)
Adjustment goggles for He-Ne laser (471 828)

3 Technical data

Protection class conforming to DIN EN 60825-1:	Laser class 3B
Wavelength:	632.8 nm
Output power	>5 mW
Beam diameter:	0.81 mm
Beam divergence:	1.1 mrad
Mode:	TEM_{00}
Minimum polarisation:	500 : 1
Service life of the tube:	> 15,000 h
Dimensions:	l = 400 mm,
	∅ = 44.2 mm
Mass:	800 g

4 Operation

- Important: Observe the safety information!
- Attach the He-Ne laser head 5 mW in the laser support (470 010).
- Insert the HV plug of the laser head into the connection socket of the switched-off power supply for the 5 mW He-Ne laser. Ensure that the plug is fully inserted.
- Before starting up the laser head, connect the earth connection to earth potential.
- Connect the power supply to the alternating current network.
- Release the power supply by operating the key switch. The laser will start after three seconds.

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